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COMMUNITY-BASED INSTITUTIONAL ARRANGEMENTS FOR HUMAN-WILDLIFE CONFLICT MITIGATION

A Management Strategy based on lessons learned from Sikkim Landscape



CHETNA NAHATA

SEPTEMBER 2017

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A MANAGEMENT STRATEGY BASED ON LESSONS
LEARNED FROM SIKKIM LANDSCAPE

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ACCRONYMS AND ABBREVIATIONS

EDC	Eco-development Committee
Forest-PLUS	Partnership for Land Use Science
GPU	Gram Panchayat Unit
HWC	Human-Wildlife Conflict
KVEDC	Kitam Village Ecotourism Development Committee
MoEFCC	Ministry of Environment, Forest and Climate Change
PA	Protected Area
REDD	Reducing Emissions from Deforestation and Forest Degradation
USAID	United States Agency for International Development

UNITS

ha	hectare
km ²	square kilometre

1.0 INTRODUCTION

The Partnership for Land Use Science (Forest-PLUS) Program is a five-year initiative jointly designed by USAID/India and the Government of India's Ministry of Environment, Forest and Climate Change (MoEFCC). The Program is focused on US-India collaborative scientific and technical research, and exchanges that explore methods and approaches to reduce emissions from deforestation and forest degradation, and enhance sequestration through conservation and sustainable management of forests (REDD+). Forest-PLUS contributes to USAID/India's Development Objective of accelerating India's transition to a low emissions economy by providing technical assistance to develop, demonstrate, and institutionalize forest management practices that reduce greenhouse gas emissions from forested landscapes, increase sequestration of atmospheric carbon in forests, protect forest biodiversity health, and protect and/or enhance forest-based livelihoods, forest ecosystem services, and other social contributions of forests in India. Through these objectives, Forest-PLUS is helping position India to participate in any internationally-agreed REDD+ mechanism.

The Program is achieving these objectives through the development of tools, techniques, and methods: (1) for an ecosystem-based approach to forest management and increasing carbon sequestration; (2) for measurement, reporting and verification of carbon stocks; (3) for building institutional structures for effective forest resource governance; and (4) by deploying these tools, techniques, and methods in selected pilot clusters in the four demonstration landscapes, representing forest types widespread in India; and is supported by training programs and communication campaigns targeting a variety of audiences. The Program commenced in August 2012. The four demonstration landscapes are Shivamogga Forest Circle, Karnataka; Hoshangabad Forest Circle, Madhya Pradesh; Rampur Forest Circle, Himachal Pradesh; and the state of Sikkim.

In each of these four landscapes, Forest-PLUS has initiated an Action-Learning Pilot Program to work with the local communities and State Forest Department officials on issues relevant to sustainable forest management and sustainable forest-based livelihoods. Forest-PLUS has also piloted some tools, techniques, and methods developed or adapted under the Program. Some of the key lessons from this field experience have been distilled into replicable and scalable management strategies, which have been documented for wider dissemination.

This document presents one such management strategy, which is based on the Forest-PLUS experience piloting community-based institutional arrangements for Human-Wildlife Conflict (HWC) mitigation in the Sikkim landscape. The document begins in section 2.0 by discussing the main issues surrounding HWC in India, including existing mitigation measures and their effectiveness. Section 3.0 then describes the management strategy developed by Forest-PLUS for creating more effective community-based institutional arrangements for HWC mitigation. Section 4.0 provides a summary of the pilot implementation of the management strategy in Sikkim landscape, and Section 5.0 discusses several key conclusions around community-based institutional arrangements for HWC mitigation.

2.0 CONTEXT: ISSUES RELATED TO HUMAN-WILDLIFE CONFLICT AND ITS MITIGATION MEASURES IN INDIA

India has a large network of Protected Areas (PAs) covering 16.09 million hectares, encompassing an area of around 4.89 percent of its total land mass. As of January 2017, India had 733 PAs including 103 National Parks, 537 Wildlife Sanctuaries, 67 Conservation Reserves and 26 Community Reserves (ENVIS, 2017). The PA network is the cornerstone of India's biodiversity conservation strategy. However, for this strategy to succeed, active cooperation of communities living in and around PAs is required. The 'fortress conservation' approach is unlikely to work in India due to the sheer number of people living near PAs¹ who are also often dependent on resources (such as fuelwood and fodder) within the PAs. Instead, active engagement with the PA-fringe communities in conservation efforts and economic development is needed, with a focus on their needs as well as the challenges faced by them.

Communities living in the fringes of forests and PAs have co-existed with wildlife for eons. However, with increasing population and subsequent increase in pressure on natural resources, forests and other wildlife habitat areas have witnessed considerable degradation. Further, several corridors linking different wildlife habitats have also been lost due to new settlements and infrastructure development. The loss of wildlife habitats and corridors has resulted in wild animals straying into human-inhabited areas, increasing instances of HWC and adversely impacting both the PA-fringe communities and the wildlife. HWC manifests itself to communities in the form of crop and livestock depredation, property damage, and threats to human life and safety due to wildlife. For communities largely dependent on agriculture, HWC impacts their food security, their livelihoods and their social well-being. Moreover, considerable opportunity costs are involved in protecting crops and livestock from damage (Barua, Bhagwat, & Jadhav, 2013). HWC also creates a conflicting situation between the communities and the government agencies involved in PA management. The negative impact on people's livelihood adversely affects their attitude towards conservation. HWC thus undermines the well-being of the communities as well as conservation goals.

The conflict between people and wildlife has attained serious dimensions in many regions of India. Although comprehensive up-to-date data on the extent of crop damage in India is not available, the government informed the Indian parliament in 2014 that around 30,000 hectares of croplands in 17 states were damaged by wildlife in 2010. The corresponding figures for 2011 and 2012 were 22,980 hectares and 19,973 hectares² respectively. Further, due to increasing HWC, the government was forced to declare some wild animals as 'vermin', thereby allowing implementation of certain control measures³.

If not addressed quickly with suitable mitigation measures, the increasing HWC could adversely affect the country's conservation efforts and negate the gains made so far. The draft National Wildlife Action Plan 2017-2031, released by the MoEFCC in the first week of February 2016, also noted concerns regarding HWC and listed HWC mitigation as one of the key focus areas.

Monetary compensation is widely used as a tool for HWC mitigation with the assumption that the amount paid by the government covers the economic loss of the PA-fringe communities caused due to

¹ It has been estimated that more than 40 per cent of the poor of the country are living in forest-fringe villages (MoEF, 2006).

² Response to question no. 2967 due for answer on 21.02.2014 in Rajya Sabha of the Indian Parliament, regarding damage of crops by wild and stray animals.

³ Section 62 of the Wildlife (Protection) Act, 1972 empowers the Central government to issue notifications declaring any wild animal, other than those specified in Schedule I and Part II of Schedule II, as vermin for any specified area and a specified period by including the species in Schedule V of the Act.

wildlife. The compensation is paid *ex-post* based on the estimate of the damage caused. However, the process is not always smooth (Barua *et al.*, 2013; Ravenelle & Nyhus, 2017). The process of estimation of the damage is cumbersome and it is not easy for the community members to collect and preserve all the evidence needed to support their claims. The community members have to incur additional costs as well, such as transport charges for repeated visits to the concerned officials. The compensation amount is usually paid after a considerable time gap since the HWC incident, and the amount paid seldomly adequately compensates for the loss incurred by the community.

Consequently, monetary compensation, though important, is not sufficient in its current form to address the issue of HWC. As a result and in summary, communities residing near PAs often harbor antagonistic attitude towards wildlife conservation (Prashanth *et al.*, 2013; Manral *et al.*, 2016) as well as government agencies, resulting in enduring conflicts between communities and wildlife. Unless some alternate mechanisms are developed to supplement the monetary compensation provided by the government, the future of India's PAs as well as the biodiversity that they support is not secure. In order to be sustainable, these mechanisms should be rooted in local community institutions and enhance their direct stake in conservation.

3.0 MANAGEMENT STRATEGY

This section presents the outline of a management strategy for community-based institutional arrangements for HWC mitigation in the fringe areas of PAs that was distilled from the experience of the Forest-PLUS Action-Learning Pilot Program in Sikkim. The details of the management strategy are presented in the next section.

The strategy specifically focuses on conflict arising from crop damage or loss in PA-fringes, which is a major component of HWC in India. It is designed to address two major issues: (1) inequitable distribution of costs and benefits of conservation between the local communities and outsiders; and (2) temporal randomness of crop loss between farmers within the affected communities. In addition to the compensation and the core institutional arrangements suggested under this management strategy, several other supplementary measures will be needed, depending on the local context. It is only with the right combination of these measures that HWC can be effectively mitigated and a positive attitude towards conservation built in the PA-fringe communities.

The illustration below captures the essence of the management strategy broadly. Further detail regarding management plan preparation and development is included in the narrative in the ensuing paragraphs. Once the HWC has been identified through field visits, exploratory studies and stakeholder consultations, the process for developing a management plan begins. This process includes activities related to mapping of stakeholders, assessing the conflict, and engaging communities. There are four key components of the management plan. The first is the development of activities for compensating the costs of conservation to communities with benefits from the existence of the PAs, such as tourism or alternative income generating activities. The second focuses on spreading the risk of crop loss among community members through the creation of new mechanisms such as community-based crop insurance. The third component, which we refer to as supporting pillars, focuses on reducing incidents of HWC by improving habitat inside PAs and developing simple and affordable crop protection measures. The final component covers monitoring the incidence of HWC through field monitoring and periodic consultations. Once the management plan is developed, it is important to support the implementation of the plan through demonstration that tests the effectiveness of the proposed activities, and adapts them based on the experience. The long term sustainability of the models relies on its ability to create a link between the conservation of the PAs and economic development. This management strategy was piloted in the Sikkim landscape. The experience and key learning from the demonstration are documented in Section 4.0.

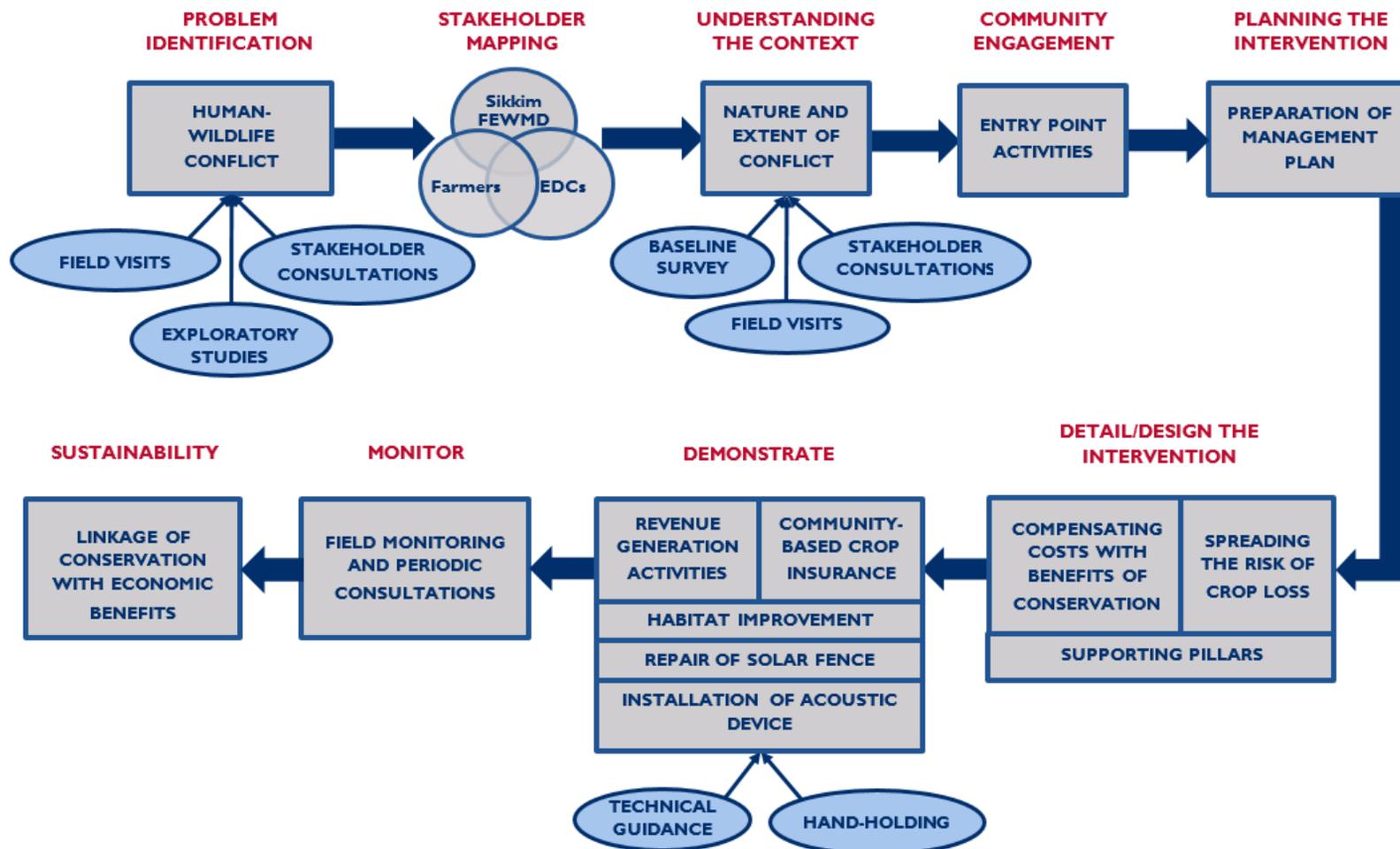


Figure 1: A schematic representation of the Management Strategy on community-based institutional arrangements for HWC mitigation

The following paragraphs present in brief some of the key elements of this management strategy.

3.1 STAKEHOLDER MAPPING

The first step involves understanding the key stakeholders in an area affected by HWC, their relationships with each other, and with the issue of HWC. It is best to use a snowball technique, where an initial set of stakeholders identifies additional stakeholders, to identify different stakeholder groups who are involved and affected either directly or indirectly. It is also important to understand the power relations between different stakeholders as well as their positions, interests, and needs (see Plate 1).

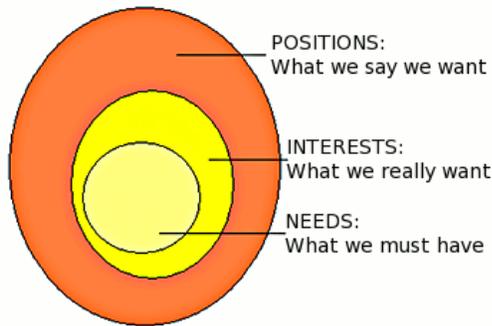


Figure 2: Conflict resolution layer model

(Adapted from the conflict resolution theories of Roger Fisher, William Ury and John Burton)

3.2 UNDERSTANDING THE NATURE AND EXTENT OF CONFLICT

It is said that a problem well stated is a problem half solved. The next step is to understand the HWC issue in the identified area in detail. This could be done through key informant interviews as well as a field survey. The interviewees should include at least the senior and frontline staff of the PA management agency and Forest Department, Panchayat representatives, members of Eco-development Committees⁴ (EDCs), and, of course, the local farmers.



V. DAKSHINAMURTHY

Plate 1: Community consultation to deliberate on issues related to HWC, organized by Forest-PLUS, in progress

Basic information – such as the wildlife species causing crop damage, types of crops being damaged, approximation of the loss incurred, current methods used by farmers to reduce crop damage, process and procedure for claiming monetary compensation, and issues related to compensation claims – should be collected to be able to plan for supplementary mitigation measures. A review of past interventions, and their efficacy and impact should also be undertaken at this stage.

⁴ In and around PAs, the committees formed under Joint Forest Management are called Eco-development Committees.



Plate 2: Community consultation addressing HWCs organized by Forest-PLUS

3.3 IDENTIFICATION OF APPROPRIATE COMMUNITY INSTITUTIONS FOR HWC MITIGATION

The communities living on the fringes of PAs have to play a significant role in any HWC mitigation effort. This is only possible through involvement of community institutions that enjoy support of the local people and also have legitimacy in the eyes of the government agencies. The Panchayat and EDC are two key institutions that could be involved in any community-based HWC mitigation initiative. To ensure an effective and durable partnership with these institutions, regular interaction and trust-building, especially through locally relevant entry point activities, is essential.

3.4 MANAGEMENT PLAN

Once the above steps are completed and a better understanding is developed regarding the key stakeholders, HWC issues and community institutions, discussion could be initiated with the Panchayats, EDCs and farmers to develop a plan for initiating a community-based institutional mechanism for mitigating HWC. This plan should be developed in a participatory manner with active involvement of the key stakeholders. Special efforts may be needed for involvement of traditionally marginalized groups such as small farmers, women, people belonging to the categories Below Poverty Line, Scheduled Castes, Scheduled Tribes, and Other Backward Castes⁵. Apart from other facilitative measures, the efforts should also include careful selection of appropriate meeting times and venues.

The plan should aim to address the following two major issues related to crop loss:

- *Inequitable distribution of costs and benefits of conservation between the local community and outsiders.* While the PA-fringe communities bear the major costs in terms of crop damage and other losses, the benefits often accrue to specific outside groups (e.g. tour operators) and the wider society.
- *Temporal randomness of crop loss between the farmers within the local community.* Although all farmers having farms near the PA are at risk of crop damage by wildlife, some inevitably suffer more than others in a particular year. This adversely affects their livelihood and food security.

In order to address the above issues, the following elements should be included in the management plan:

- **Compensating the costs with benefits of conservation**

⁵ The categories Below Poverty Line, Scheduled Castes, Scheduled Tribes, and Other Backward Castes are the main categories of disadvantaged groups recognized by the government.

Communities residing near the PAs mostly bear the cost of conservation, but hardly receive any direct economic benefit. The most important element of the strategy is to explore positive impacts within the purview of the situational potential of the available sites (including externalities) of the PA and tap these to compensate for the negative impacts of the PA.

For example, many PAs have high tourism potential. This potential is either untapped or the benefits are cornered by outsiders such as hoteliers and tour operators, with little to no benefits reaching local communities that face the brunt of negative impacts in the form of HWC. If a part of the income from tourism is channeled to local communities, not only would they be compensated for their losses, but more importantly they would develop a direct stake in the conservation of PA resources. With active involvement of the local community in decision making, a sustainable nature-based tourism plan could be developed and implemented. In order for this to have the desired impact, the local community should be actively involved in designing the institutional parameters, especially safeguards for intra-community equity.

It is of utmost importance that the community members agree on a benefit-sharing mechanism and ways to maintain transparency, participation, and accountability.

A practical way to develop and implement this plan is to form a working committee with adequate representation from different sections of the community. There could also be sub-committees to focus on specifics, such as homestays, trekking, rafting, bird watching, or butterfly watching.

- **Spreading the risk of crop loss amongst the community**

In some PA-fringe areas, the extent of crop damage is such that farmers are forced to abandon farming and move to other livelihood options such as wage labor, non-farm professions, or out-migration. In most PA-fringe areas, however, farming remains a viable economic activity for the local community as a whole. Nonetheless, for the households that suffer extensive losses in a particular year, crop damage by wildlife could put them on a downward spiral of poverty and adversely affect their well-being.

It has already been discussed that the monetary compensation mechanism of the government, though important, is not sufficient to adequately compensate the affected households for their losses. Further, it suffers from several procedural constraints and inefficiencies. Building on the traditional culture of community self-reliance and self-help, a community-based insurance mechanism is a viable supplement to mitigate risk from wildlife. In an ideal case, this would pool risk for the community and provide a safety net for vulnerable households to cope with the shock of extensive crop loss.

In order for this mechanism to work, it has to be developed in a participatory manner with active involvement of all key stakeholders. Fairly detailed rules will need to be devised by the local community to deal with different possible scenarios of crop damage. A practical way to formulate these rules is to form a working committee with representation from all the relevant stakeholders. This institutional mechanism will be robust and long-enduring only if all the key stakeholders (such as Panchayats, EDCs and farmers) are onboard and actively engage in the entire process, from planning to execution.

- **Supporting pillars**

As discussed earlier, HWC is a complex issue and requires a multi-pronged approach to address it. While the institutional mechanisms listed above form the core of the management strategy to address the issue of compensating the crop loss of PA-fringe communities, these need to be supplemented with measures to reduce the HWC incidents. These measures should include: (1) wildlife habitat improvement so that wildlife is not forced into the farms, and (2) creation of barriers to prevent their movement towards human habitations and agriculture fields. As with other components of the strategy,

these measures should be decided in a participatory manner, with active involvement of the local community members and other relevant stakeholders.

4.0 PILOTING THE MANAGEMENT STRATEGY IN SIKKIM

Before presenting a summary of experience of piloting the management strategy in Sikkim landscape in this section, a brief of the landscape is discussed to provide a context to the field demonstration.

4.1 LANDSCAPE CONTEXT

Sikkim is situated in the Himalayan range in the northeast of India. The state covers about 7,096 km² (FSI, 2015). Owing to its diverse eco-climatic conditions and wide altitudinal variation, the state is rich in flora and fauna, and is part of the Himalaya Biodiversity Hotspot. Forest lands cover about 82 percent of the geographical area of the state. The state has nine PAs, covering almost 31 percent of its total geographical area. HWC in the fringe villages of these PAs is on the rise and farmers face recurrent challenges in the form of crop loss by wildlife (Bhutia, 2016-17). Though farmers take measures such as scarecrows, fencing, and sleeping in the fields to protect their crops, still crop loss is widespread. Although the farmers do expect and demand compensation from the government, they also realize that the existing compensation mechanism is inefficient and inadequate.

Forest-PLUS worked with the communities in the fringe areas of Pangolakha Wildlife Sanctuary and Kitam Bird Sanctuary to pilot a strategy based on supplementary community-based institutional arrangements for mitigating human-wildlife conflict in the area. Pangolakha is situated in the East Sikkim district and Kitam is situated in South Sikkim district. In both the areas, agriculture is the most important source of livelihood for the locals and crop damage due to wildlife is a serious concern.

4.2 FIELD DEMONSTRATION OF THE MANAGEMENT STRATEGY

4.2.1 STAKEHOLDER MAPPING

Forest-PLUS conducted a number of key informant interviews which, combined with the domain knowledge of its staff members, resulted in mapping of key stakeholder groups and their inter-relations. Stakeholder consultations were also organized around Pangolakha Wildlife Sanctuary and Kitam Bird Sanctuary to gain deeper understanding of their positions, interests and needs. The Panchayats, EDCs, local communities, frontline forest officials, senior officials of Forest Department, and some non-governmental organizations working on wildlife issues, were identified as the key stakeholders.

4.2.2 UNDERSTANDING THE NATURE AND EXTENT OF CONFLICT

The next step entailed understanding the nature and extent of HWC in the fringes of the two PAs. During a detailed survey by Forest-PLUS in seven Gram Panchayat Units (GPUs) in the fringe of these two PAs, it was found that agriculture is the major source of livelihood (see Table 1). Crop damage by wildlife was found to be a major concern for farmers. Large cardamom, an important cash crop in the areas surrounding Pangolakha Wildlife Sanctuary, was severely affected due to wildlife damage. In the villages near Kitam Bird Sanctuary, various crops – such as paddy and millet – were regularly raided by wildlife.

Table 1: Livelihood profile of villagers in fringe areas of Pangolakha Wildlife Sanctuary and Kitam Bird Sanctuary

PROTECTED AREAS	SAMPLE GPU	PERCENTAGE OF SAMPLE HOUSEHOLDS ENGAGED IN:				
		AGRICULTURE	BUSINESS AND SERVICES	CATTLE REARING	POULTRY	OTHERS
Pangolakha Wildlife Sanctuary	Aritar	100%	11%	29%	36%	0%
	Dholepchen	100%	8%	26%	20%	6%
	Lingtam-Phadamchen	100%	4%	21%	21%	0%
	Premlakha-Subanedara	100%	20%	39%	61%	3%
	Rhegoh	100%	1%	29%	39%	0%
	Changeylakha	100%	8%	14%	14%	0%
Kitam Bird Sanctuary	Kitam-Manpur	91%	54%	71%	70%	6%

Source: Field Survey 2016

Major wildlife species causing damage in the two areas included wild boar, Himalayan palm civet, monkey and porcupine. Table 2 lists the three major crop raiders in each GPU. Simple crop protection measures – including scarecrows and fencing – used by farmers were not effective for keeping the wildlife away. The survey revealed that around 20 to 50 percent of crop yield is lost owing to damage by wildlife in the seven GPUs.

Table 2: Major wildlife species causing crop damage

PROTECTED AREAS	SAMPLE GPU	SPECIES 1	SPECIES 2	SPECIES 3
Pangolakha Wildlife Sanctuary	Aritar	Himalayan Palm Civet	Monkey	Porcupine
	Dholepchen	Wild Boar	Himalayan Palm Civet	Monkey
	Lingtam-Phadamchen	Porcupine	Himalayan Palm Civet	Monkey
	Premlakha-Subanedara	Himalayan Palm Civet	Monkey	Porcupine
	Rhegoh	Monkey	Himalayan Palm Civet	Porcupine
	Changeylakha	Porcupine	Himalayan Palm Civet	Monkey
Kitam Bird Sanctuary	Kitam-Manpur	Wild Boar	Monkey	Indian Peafowl

Source: Field Survey 2016

Further, it was found that compensation for crop loss was inadequate as well as inefficient as a mitigation tool. Out of the seven GPUs, farmers of only four had received compensation in the last few years. The compensation was given at a flat rate and was not commensurate with the crop loss incurred. Moreover, the compensation amount was received three to four years after filing the claim. The farmers further spent a lot of their resources in following up with the authorities for compensation. Some farmers, especially around Kitam Bird Sanctuary, had gradually switched from agricultural to non-

agricultural activities due to recurring crop loss coupled with inadequate compensation offered. This had resulted in an antagonistic feeling amongst the community towards wildlife conservation.

4.2.3 IDENTIFICATION OF APPROPRIATE COMMUNITY INSTITUTIONS FOR HWC MITIGATION

Forest-PLUS held periodic consultations with the communities and key institutions in the fringe areas of Pangolakha Wildlife Sanctuary and Kitam Bird Sanctuary in order to understand the local governance structures. Efforts were also made to improve their awareness about the benefits of conservation. To ensure that the initiative is sustainable, it was important that local communities and the key local institutions played a significant role in the mitigation of HWC. In both the PAs, Forest-PLUS anchored its pilot intervention on community-based HWC mitigation measures within the respective EDCs. This was based on the premise that the EDCs had been constituted to deal with issues related to PA management and enjoyed the support of both community members and the government agencies, especially the Forests, Environment and Wildlife Management Department.



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Plate 3: Forest-PLUS representatives discussing HWC issues with the Kitam EDC members

Forest-PLUS maintained regular interaction with the EDCs and held many consultations with the EDC office bearers as well as general members, to understand their perspectives on HWC, and to prepare a plan for the mitigation activities.

4.2.4 PILOTING THE MANAGEMENT PLAN

In both the Gram Panchayats, the EDCs were made the focal point of interaction. The first step was to explore ways to compensate the costs (including negative externalities) of the PA through its benefits (including positive externalities). The next step was to consider different institutional mechanisms of spreading the risk of crop loss amongst the community. Based on the interaction with the EDCs and other stakeholders, it was decided to pilot the former mechanism in Kitam-Manpur GPU near Kitam Bird Sanctuary as the PA already attracted many tourists. In Pangolakha Wildlife Sanctuary, as the realization of tourism potential required considerable investment and coordination between two state governments (it is on the border between Sikkim and West Bengal), it was decided to pilot the latter mechanism of spreading the risk amongst the community members through a community-based crop insurance scheme in Dholepchen GPU.

- **Compensating the costs with benefits of conservation**

In Kitam Bird Sanctuary, the last few years have witnessed development of tourism activity. Generally, when tourism flourishes near PAs, the major economic benefits are cornered by entrepreneurs and agencies from outside the community, while the locals are mostly engaged in relatively lower-paying jobs. While this was true for Kitam Bird Sanctuary as well, there was one significant difference. The

locals were aware of the potential benefits of tourism for their livelihoods and local economy, and had initiated some steps to realize that potential. A local body called the Kitam Village and Ecotourism Development Committee (KVEDC) had been established to explore the possibilities of various nature-based activities like bird and butterfly watching, trekking, and rafting. Some of the major potential sources of income identified were camping and homestays.



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Plate 4: Canopy walk constructed using bamboo inside the PA near Kitam-Manpur GPU, South Sikkim

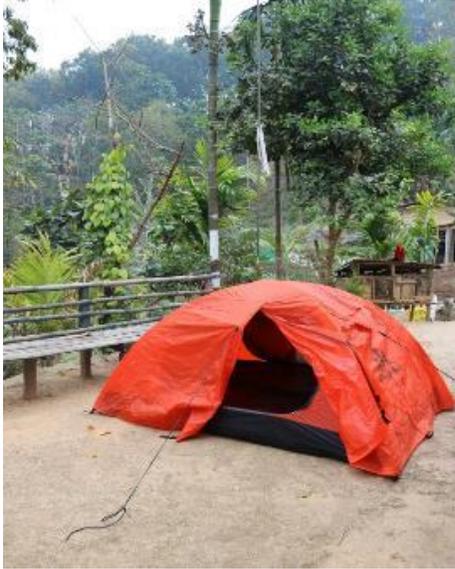


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Plate 5: One of the bird watching trails in the PA near Kitam-Manpur GPU, South Sikkim

Ecotourism is distinguished by its emphasis on conservation and active community participation. Forest-PLUS worked with the Panchayat, EDC and the community of Kitam-Manpur to strengthen the institutional mechanism of the KVEDC for sustainably and successfully implementing the activities of ecotourism. The KVEDC and the EDC collectively formed the operational rules for management of ecotourism in the area. In order to kick-start their initiative Forest-PLUS provided camping tents (sleeping tents, kitchen tent and washroom tent) to KVEDC. The KVEDC agreed to provide a part of the revenue earned through tourism for compensating crop loss of the farmers and thereby mitigating HWC. Forest-PLUS is working with KVEDC and EDC to help them fine-tune rules and the institutional mechanism for the same.

In order to further strengthen such community-based initiatives, Forest-PLUS is also supporting the local Biodiversity Management Committee that has the mandate to manage access and benefit sharing from the local biological resources. The ultimate objective is to support conservation efforts by strengthening the linkages between biodiversity and the livelihood of PA-fringe communities, so as to help the community to gain from the positive impacts (including externalities) of the PA and reduce the impact of negative impacts (including externalities).



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Plate 6: Sleeping tent provided to KVEDC by Forest-PLUS in Kitam, South Sikkim

- **Spreading the risk of crop loss amongst the community**

In Dholepchen GPU, Forest-PLUS worked with the EDC and other important stakeholders to formulate ways that could spread the risk of crop loss amongst the farmers, and make the community more self-reliant by supplementing the compensation received from the government.



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Plate 7(a): Cardamom crop in Dholepchen GPU, East Sikkim

Plate 7(b): Dried large cardamom pods in Dholepchen GPU, East Sikkim

While crop loss due to vagaries of weather or pest attack is covered under formal crop insurance schemes, wildlife damage is usually excluded⁶. However, insurance principles can be employed to devise an informal community-based mechanism to spread the risk amongst the community members.

⁶ The Government of India introduced the 'Pradhan Mantri Fasal Bima Yojana' in the year 2016, by replacing the National Agricultural Insurance Scheme. The insurance scheme protects the farmer against losses suffered by them due to crop failure on account of natural calamities. The scheme is available to all farmers, loanee and non-loanee, irrespective of size of their holding. It covers all food crops (cereals, millets and pulses) and oil seeds and annual commercial/horticultural crops. This scheme, however, excludes crop loss due to wildlife.

Taking into consideration the economics of cultivation of large cardamom (a major cash crop of Sikkim) and the losses incurred by the farmers due to HWC, Forest-PLUS facilitated the formulation of an informal community-based cardamom crop insurance scheme. The main objective of this institutional mechanism was to spread the risk of crop loss amongst the community and supplement the meager amount received as compensation.

Forest-PLUS facilitated the farmers, EDC members and Panchayat members to form a working committee for implementation of the insurance scheme. Various responsibilities pertaining to implementation of the insurance scheme viz. premium collection, damage monitoring and recording, decision on compensation, and disbursement of compensation to the affected farmers, were taken up by various sub-committees of the working committee. The working committee included members from the EDC and Panchayat, as well as representatives from the community.



Plate 8: Premium collection facilitated by Forest-PLUS in Dholepchen GPU, East Sikkim

The working committee, with support from Forest-PLUS, prepared the operational rules of the cardamom crop insurance scheme. The premium was collected from participating members, either in cash or in-kind. In order to kick-start the mechanism, Forest-PLUS provided a one-time seed capital to the community in the form of a matching premium.

The scheme covers two kinds of damage reported for large cardamom, *i.e.* for damage or loss of crop and for loss of sapling. The premium collected was a lump-sum amount for two years, paid either in cash or in-kind (in the form of dried cardamom).

The effort that went into formulating the scheme and the extent of involvement of the local community members is reflected in the following illustrative extract from the rules for the community-based insurance mechanism agreed by the community:

- 'Cardamom capsule' damage or loss: The actual damage or loss of capsules will be considered and covered. The capsules damaged or lost will be measured on the basis of cleared and removed calyx or residual of capsule left near the tiller/clump. A maximum of four spikes per capsule bearing tiller will be considered and covered under this plan. Each spike will be limited to a maximum of 50 capsules (the average weight of a capsule will be taken as 2.5g).
- 'Cardamom capsules bearing tiller' damage or loss: The absolute number of 'capsules bearing tiller' damaged or lost will be considered and covered. In case of complete damage or loss of a clump, a maximum of eight capsules bearing tillers (per clump) will be considered and covered under this plan.
- The scheme provides for guaranteed as well as non-guaranteed benefits. As the first payout, an amount of 1.5 times of the damage or loss incurred will be paid as a guaranteed benefit, up to a maximum of 1.5 times of the premium paid during the term of the plan (subject to the terms, conditions, and provisions detailed). Although Forest-PLUS gave other alternatives, the community

perceived that a generous first payout of 1.5 times would generate interest and encourage participation. As the second payout, an amount of 0.5 times of the damage or loss incurred will be paid as the non-guaranteed benefit, up to a maximum of 0.75 times of the premium paid during the term of the plan (subject to the terms, conditions, and provisions detailed). In the case of 'cardamom capsules bearing tillers' plan, the amount was fixed at INR 3.00 per capsule bearing tiller.



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Plate 9: A consultation in progress at Dholepchen GPU to deliberate on formulation of the Cardamom Insurance Scheme

• **Supporting Pillars**

In both Dholepchen and Kitam-Manpur, a range of other related activities were undertaken by Forest-PLUS in consultation with the community, EDC, Panchayat and the State Forest Department. A plan was prepared focusing on habitat improvement measures inside the PAs (e.g. development of water holes and salt licks to benefit the wildlife) and measures to prevent crop raiding (e.g. installation of acoustic devices and repair of solar fence).



CHETNA NAHATA



BASANT SHARMA

Plate 10(a): Forest-PLUS is providing assistance for solar fence repairing in Kitam, South Sikkim

Plate 10(b): Forest-PLUS procured acoustic devices to minimize HWC

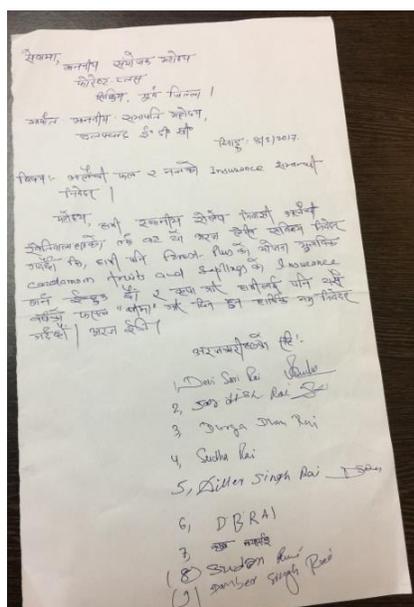
5.0 CONCLUSION

The management strategy demonstrated in Pangolakha Wildlife Sanctuary and Kitam Bird Sanctuary shows that community-based institutional arrangements can supplement the government monetary compensation mechanism and contribute towards reducing HWC.

One of the most cost-effective and sustainable ways is to compensate the negative impacts of the PAs (e.g. crop raiding) through positive impacts (e.g. enhanced tourism). The second institutional mechanism is to spread the risk among the community members through an informal community-based insurance scheme.

While the former is likely to enhance the local communities' direct stake in conservation, the latter will protect the most vulnerable households from crop loss shocks, making them more resilient. Both mechanisms are likely to mitigate HWC and reduce local communities' antagonism towards PAs and PA managers.

These mechanisms can be replicated and scaled up. In fact, neighboring villages have requested Forest-PLUS to initiate a similar mechanism for HWC mitigation.



SUSHIL SAIGAL

Plate 11: Letter from a neighboring village requesting Forest-PLUS to initiate a similar community-based crop insurance scheme in their village

However, these mechanisms are likely to be effective and sustainable only if they are devised in a participatory manner with active involvement of all stakeholders, have transparent benefit-sharing and conflict resolution mechanisms, and build on local culture and traditional institutions. It is worth recognizing as well that the crop-insurance scheme will only be effective if the pooled risk from wildlife to crops is low enough to ensure that premiums are affordable to those enrolled, and that there are effective monitoring and distributions mechanisms in place so that claims for compensation are fair and prompt. Since land pressure in India is extremely high, a reality is that forest-fringe communities often do not have alternative locations where they can easily relocate. Keeping that constraint in mind, if with further monitoring it is found that premiums are unaffordable given the associated risk of damage, it is worth considering how those can be subsidized – either directly through the government, or indirectly through revenues from ecotourism. Another option is for the authorities to subsidize the costs of deterring wildlife from crops either using the approaches mentioned here or through other mechanisms.

We emphasize that in order to be effective in the future, efforts by government to mitigate these types of social and environmental conflicts should to the maximum extent feasible set out goals and provide economic support for those goals, but decentralize the development and implementation of solutions. The goals and effective use of the economic support should be monitored, and effective grassroots solutions scaled up. This approach makes the best use of local knowledge and will maximize the ability of democratic government to facilitate socially desirable solutions for its constituents.

REFERENCES

- Barua, M., Bhagwat, S. A., & Jadhav, S. (2013). The hidden dimensions of human–wildlife conflict: Health impacts, opportunity and transaction costs. *Biological Conservation*, 309-316.
- Bhutia, K. C. (2016-17, October-December). Human Wildlife Conflict in Sikkim. *ENVIS Sikkim Quarterly Newsletter*, pp. 4-5.
- Draft National Wildlife Action Plan (NWAP) 2017-2031. (2016, February 03). *Draft National Wildlife Action Plan (NWAP-3)*. New Delhi, India.
- ENVIS. (2017). *Protected Areas of India*. Retrieved June 15, 2017, from ENVIS Centre on Wildlife & Protected Areas: http://www.wiienvis.nic.in/Database/Protected_Area_854.aspx
- FSI. (2015). *India State of Forest Report*. Dehradun: Forest Survey of India, Government of India.
- Manral, U., Sengupta, S., Hussain, S. A., Rana, S., & Badola, R. (2016). Human-Wildlife Conflict in India: A Review of Economic Implication of Loss and Preventive Measures. *Indian Forester*, 142(10), 928-940.
- MoEF. (2006). *Report of the National Forest Commission*. New Delhi: Ministry of Environment, Forest and Climate Change, Government of India.
- Prashanth, P. M., Kumara, V., & Thirumala, S. (2013). Man - Animal conflicts in Protected Areas, a case study of Gaur, BosGaurus H Smith from the Mookambika Wildlife Sanctuary, Kollur, Karnataka, India. *International Journal of Current Microbiology and Applied Sciences* ISSN: 2319-7706 Volume 2 Number 12 (2013) pp. 466-475, 466-475.
- Ravenelle, J., & Nyhus, P. J. (2017). Global Patterns and Trends in Human-Wildlife Conflict Compensation. *Conservation Biology*.



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